

A REVIEW OF *CUMMINGSIA* FERRIS
(MALLOPHAGA: TRIMENOPONIDAE), WITH A
DESCRIPTION OF TWO NEW SPECIES

Robert M. Timm and Roger D. Price

Abstract.—Descriptions and illustrations are given for the four previously recognized species of *Cummingsia*: *C. inopinata* Méndez, *C. intermedia* Werneck, *C. maculata* Ferris, and *C. peramydis* Ferris; and for two new species: *C. albuja* from *Caenolestes fuliginosus* (Tomes) and *C. perezii* from *Caenolestes convelatus* Anthony, both from Ecuador. A key is provided for the identification of these six species. *Acanthomenopon* Harrison is recognized as a subgenus to contain a single species, *C. peramydis*, parasitic on the marsupial genus *Monodelphis*. The subgenus *Cummingsia* contains the other five species which are parasitic on the marsupial genera *Caenolestes*, *Lestoros*, and *Marmosa*, and the rodent genus *Thomasomys*.

For nearly half a century, the mallophagan genus *Cummingsia* Ferris (Trimenoponidae) was known by only three species distributed on South American marsupials: *C. intermedia* Werneck, 1937, from *Marmosa dryas* Thomas and *Marmosa incana* (Lund); *C. maculata* Ferris, 1922, from *Lestoros inca* (Thomas); and *C. peramydis* Ferris, 1922, from *Monodelphis brevicaudata* (Erxleben) and *Monodelphis domestica* (Wagner). In 1971 Méndez described a fourth species, *C. inopinata*, from a rodent, *Thomasomys cinereiventer* J. A. Allen.

We recently collected two new species of *Cummingsia* from two other South American marsupials, *Caenolestes convelatus* Anthony and *Caenolestes fuliginosus* (Tomes). The collections are of interest in that these two species of *Cummingsia* represent the first records of Mallophaga on hosts in the genus *Caenolestes*. Description of these two new species has prompted us to review the entire genus *Cummingsia* and to provide a key for the identification of all six species. The genus *Cummingsia* appears to be restricted to the New World marsupials and the rodent genus *Thomasomys*. We now recognize two subgenera, the nominate subgenus containing five species and *Acanthomenopon* Harrison containing a single species.

Genus *Cummingsia* Ferris

Cummingsia Ferris, 25 Apr 1922:83.

Type-species.—*C. maculata* Ferris.

Acanthomenopon Harrison, 17 May 1922:156.

Type-species.—*A. horridum* Harrison.

Remarks.—Ferris (1922:83) characterized the genus *Cummingsia* as follows: "lateral margin of the head at the most but slightly notched; with two pairs of strong, flattened, backward-pointing spines on the ventral side of the head, these arising from just before the bases of the antennae; with the clypeal region not

delimited dorsally by a transverse suture; with the antennal fossae not covered beneath by a flap; with the mesonotum quite distinct; without pulvilli on the first segment of the tarsi; with the genitalia of the males of a simple type."

To this characterization we would add the following: esophageal sclerites reduced; antenna 4-segmented, with pedunculate third segment and relatively small fourth segment bearing large sensillum and stout blunt seta and small setae (Fig. 2); each leg with 2 pairs of claws; with 5 pairs of abdominal spiracles, these distributed on III–VII; male genitalia of type in Fig. 3, parameres outwardly curved with short subapical seta (Fig. 4), medioposteriorly with broad bifurcate plate, and spinous sac with small sclerite of various shapes.

Subgenus *Cummingsia* Ferris

Remarks.—The five species in this subgenus may be characterized by the following combination of features: head shaped much as in Fig. 1; temple with each side having 3 very long setae, placed submarginally (Figs. 1, 9, 12, 15, or 17); with shorter postmental setae (Fig. 1); gula with chaetotaxy of 1 very long + 4 much shorter setae on each side and without spinous sculpturing (Figs. 1 or 17); metanotal chaetotaxy as in Fig. 1, with 2 spiniform setae placed mediad to outer very long marginal seta; marginal tergal and sternal setae mostly subequal in length (Fig. 1); and female subgenital plate as in Figs. 8 or 14, with 4 short to minute medioposterior setae.

Cummingsia albuja, new species

Figs. 1–8

Type-host.—*Caenolestes fuliginosus* (Tomes) [Marsupialia: Caenolestidae].

Male.—As in Fig. 1. Dorsal head chaetotaxy with seta mediad to large spiniform seta long, over twice length of spiniform; other setae with lengths as shown. Both ventral spinous processes on each side blunt, close together. With well-developed heavily pigmented carina across posterior head margin and lacking medioposterior protrusion such as in Fig. 17 or 21. Thoracic sternal plates as in Fig. 5; prosternal plate with 7 long, 7 short stout setae; mesosternal plate with 5 long, 5 (less often 4 or 6) short stout setae; metasternal plate with 15 (less often 16 or 17) short to long setae. Tergal setae: I, 6 (with outermost very short, innermost twice length of adjacent seta (Fig. 6)); II–VII, 6; VIII, 4 (less often 3); IX, 1 very long, 1 medium on each side. Sternal setae: I, 9–10; II, 20–22; III, 12–14; IV, 12–13; V, 10–12; VI, 7–9; VII, 6 (less often 5 or 7); those on I–II including shorter anterior setae. Subgenital plate (fused VIII–IX) with 10 setae, as in Fig. 7. Dimensions: preocular width (POW), 0.26–0.28; temple width (TW), 0.35–0.38; head length (HL), 0.23–0.25; prothorax width (PW), 0.32–0.35; metathorax width (MW), 0.37–0.40; abdomen width at segment V (AW), 0.54–0.59; total length (TL), 1.15–1.25. Genitalia as in Fig. 3, with genital plate broadly tapered, with sac sclerite thin, "U"-shaped, and with tip of paramere with subapical seta well removed from end (Fig. 4); genitalia width (GW), 0.08–0.10; genital plate width (GPW), 0.06–0.07; genital plate length (GPL), 0.05–0.06.

Female.—Much as for male, except as follows. Sternal setae: I, 9–11; II, 21–25; III, 13–15; IV, 12–14; V, 10–13; VI, 9–12; VII (fused with VIII), 8–12.

Subgenital plate (fused VIII–IX) with 12 (less often 11) setae, including 4 minute medioposterior setae associated with break in plate (Fig. 8). Anus circular, with 25–28 minute to medium setae (Fig. 8). Dimensions: HL, 0.23–0.26; PW, 0.35–0.36; MW, 0.43–0.45; AW, 0.68–0.73; TL, 1.21–1.40.

Remarks.—This is the only known species of *Cummingsia* for which both sexes have no abdominal tergites with more than six setae; this separation is further supported by differences in dimensions, dorsal head chaetotaxy, details of male genitalic structure, and sternal chaetotaxy.

Etymology.—This new species is named in honor of Dr. Luis Albuja V. of the Escuela Politécnica Nacional, Quito, in recognition for his studies on Ecuadorian mammals, and for generous assistance with this project.

Holotype.—Adult ♂, ex *Caenolestes fuliginosus*, Ecuador, Napo Province, 6.9 km W of Papallacta, 24 Jun 1978, collected by R. S. Voss (UMMZ 127107); in collection of University of Michigan.

Paratypes.—Ex *C. fuliginosus*: 5 ♂♂, same as holotype; 2 ♂♂, 2 ♀♀, Ecuador, Napo Province, vic. Papallacta, 4 May 1980, R. S. Voss #739 (UMMZ 155578); 3 ♂♂, 3 ♀♀, same except 6 May 1980, #749 (UMMZ 155693); 1 ♂, same except 23 Mar 1980, #630; 1 ♀, same except 7 May 1980, #763 (UMMZ 155580); 1 ♀, Pichincha Province, Volcan Pichincha, 10 Apr 1939, C. Ollalla (FMNH 53296). Paratypes will be distributed among the University of Michigan, University of Minnesota, Oklahoma State University, U.S. National Museum of Natural History, and Field Museum of Natural History.

Cummingsia maculata Ferris

Figs. 9–11

Cummingsia maculata Ferris, 1922:83.

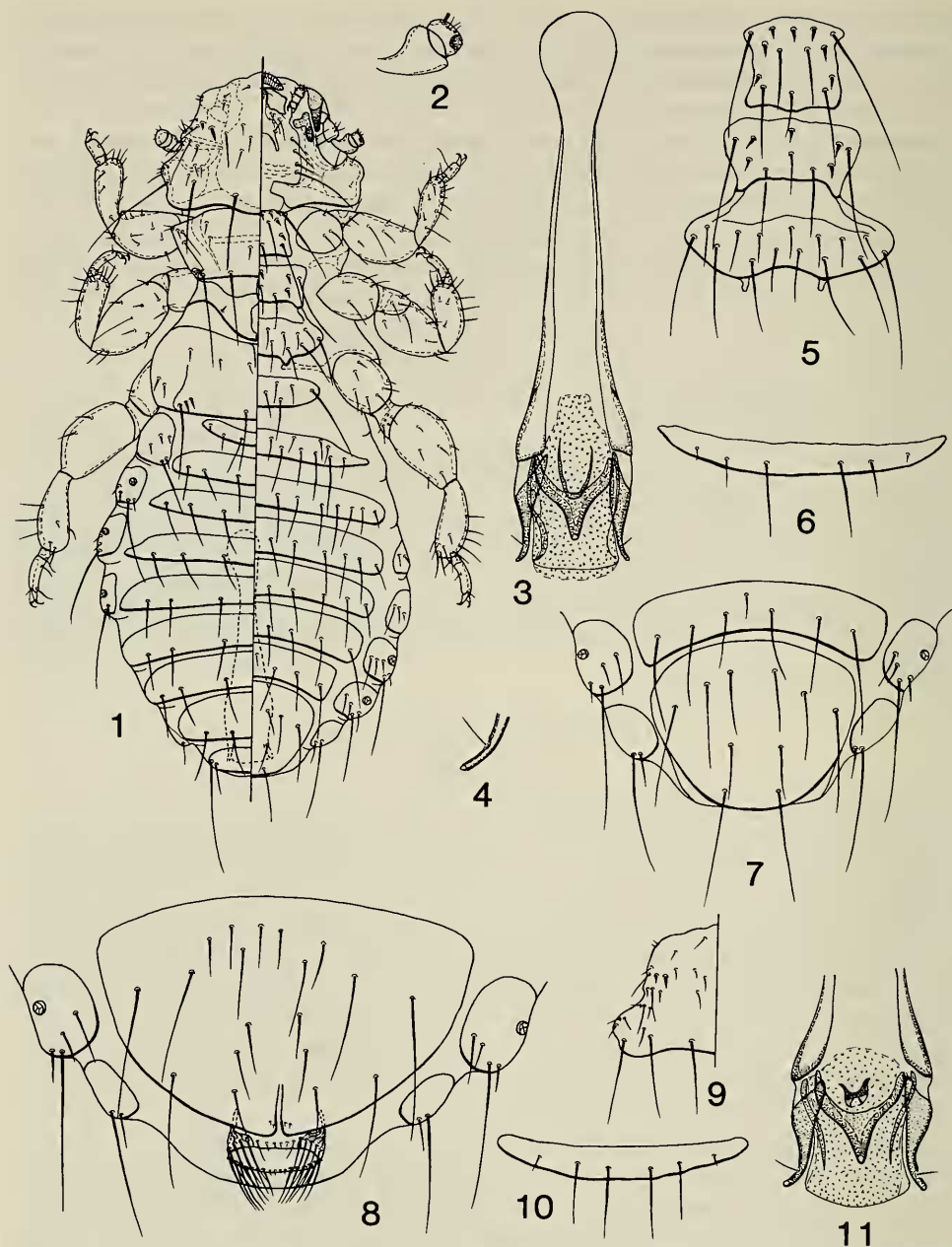
Type-host.—*Caenolestes* sp. = *Lestoros inca* (Thomas) [Marsupialia: Caenolestidae].

Male.—Close to *C. albuja*, differing as follows. Head with seta mediad to large spiniform seta short, of approximately same length; with 2 series of short + long + short setae posterior to spiniforms (Fig. 9). Tergite I with medial 4 setae subequal in length (Fig. 10). More tergal setae: III, 7–8; IV–VI, 8; VII, 7–8; VIII, 6. Sternal setae: II, 21–26; III, 14–16; IV, 12–14. Dimensions: HL, 0.22–0.24; PW, 0.29–0.30; AW, 0.50–0.56; TL, 1.05–1.16. Genitalia (Fig. 11) with small “butterfly”-shaped sclerite associated with genital sac.

Female.—Also close to *C. albuja*, differing in having chaetotaxy of head and tergite I same as for male. Metasternal plate with 18 setae. Tergal setae: III, 8; IV, 9; V, 10; VI, 9. Sternal setae: I, 12; II, 31; III, 20; IV, 17. Anus with 24 setae.

Remarks.—This species differs from the preceding species by consistently having tergites III–VII with more than six setae, by the lengths of certain setae on the dorsal head and tergite I, by the male with a differently-shaped genital sac sclerite, and by the female with more sternal setae on I–IV.

Ferris (1922:83) reported the type-host and type-locality for *Cummingsia maculata* as “*Caenolestes* sp., Cedrobamba Ruins, Peru,” and mentioned that the specimens are from a skin in the United States National Museum. Emerson and Price (1981) subsequently listed *Lestoros inca* as the type-host for *C. maculata*.



Figs. 1-11. 1-8. *Cummingsia albuja*: 1, Dorsal-ventral male; 2, Male terminal antennal segments; 3, Male genitalia; 4, Tip of male genitalic paramere; 5, Male thoracic sternal plates; 6, Male abdominal tergite I; 7, Ventral male terminalia; 8, Ventral female terminalia. 9-11. *C. maculata*: 9, Dorsal male head; 10, Male abdominal tergite I; 11, Apical portion of male genitalia.

As *Caenolestes fuliginosus* recently has been reported in northern Peru (Barkley and Whitaker 1984), we thought it advisable to double-check the identity of the host. The mammal collection of the U.S. National Museum does contain a series of 17 specimens of *Lestoros inca* collected by Heller in May and June of 1915. The locality data for the series are listed on the skin tags as follows: Peru: Machu Picchu, Cedrobamba, Timber Line, 12,000 ft. On the back of the tag on two of these (USNM 194403 and 194427) it reads Cedrobamba Ruins rather than just Cedrobamba. Hence, it is likely that one of these two specimens represents the host animal from which Ferris obtained his series of one female and four males of *Cummingsia* that he described as *C. maculata*. *Lestoros inca* is the only caenolestid known from southern Peru and there is little doubt about the fact that it is the type-host for *C. maculata*.

Material examined.—Holotype ♀, allotype ♂, 3 ♂♂ paratypes of *C. maculata*, ex *Lestoros inca*, Peru, Cedrobamba Ruins.

Cummingsia perezii, new species

Figs. 12–14

Type-host.—*Caenolestes convelatus* Anthony [Marsupialia: Caenolestidae].

Male.—Close to *C. albuja*, but differing as follows. Dorsal head setae generally longer (Fig. 12). Metasternal plate with 16 setae. More tergal setae: II–IV, 8; V–VI, 9; VII, 8; VIII, 6. Lengths of setae on tergite I near to those of *C. maculata* (Fig. 10). More sternal setae: I, 15; II, 27; III, 22; IV, 20; V, 19; VI, 15; VII, 11. Subgenital plate with 11 setae. Much larger dimensions: POW, 0.31; TW, 0.40; PW, 0.39; MW, 0.44; AW, 0.69; TL, 1.29. Genitalia (Fig. 13) with broader terminal portion of genital plate and with different shape of sac sclerite; GW, 0.10.

Female.—Much as for male, except as follows. Metasternal plate with 17 setae. Tergal setae: I, 7; II, 11; IV, 9; VI–VII, 10. Sternal setae: I, 13; II, 31; III, 24; IV, 21; V, 18; VI, 16; VII, 13. Subgenital plate not medially divided, with longer medioposterior 4 setae and with 2 long lateroposterior setae on each side (Fig. 14). Anus with 30 setae, medial ones in both ventral and dorsal rows longer than for other species (Fig. 14). Also with large dimensions: POW, 0.32; TW, 0.42; PW, 0.42; MW, 0.50; AW, 0.84; TL, 1.50.

Remarks.—The combination of very large dimensions, large number of tergal and sternal setae, and details of dorsal head chaetotaxy for both sexes, the structure and chaetotaxy of the female ventral terminalia (it is the only *Cummingsia* with two long lateroposterior setae on each side of subgenital plate instead of only one), and the details of the male genitalia separate this species from all others of the genus.

It is interesting that the two adults representing the type-series of this new species occurred on the same individual host also yielding three adults of another *Cummingsia* species; of five fairly advanced nymphs found on the same host, two were consistent with this new species in size and chaetotaxy, three with the other species.

Etymology.—This new species is named in honor of Sr. Carlos Perez Q., owner

of Hacienda La Vega, for graciously allowing us to work on his property where the new species of *Cummingsia* was obtained.

Holotype.—Adult ♀, ex *Caenolestes convelatus*, Ecuador, Imbabura Province, Hacienda La Vega, 5 km ESE of San Pablo del Lago, elevation ca. 2600 m, 11 Sep 1983, collected by R. M. Timm (FMNH 124620); in collection of Field Museum of Natural History.

Paratype.—1 ♂, same as for holotype.

Cummingsia inopinata Méndez

Figs. 15–16

Cummingsia inopinata Méndez, 1971:23.

Type-host.—*Thomasomys cinereiventer* J. A. Allen [Rodentia: Cricetidae].

Male.—Close to *C. albuja* (Fig. 1), but differing as follows. Unique dorsal head chaetotaxy (Fig. 15), without any mediolateral heavy spiniform setae. Prosternal plate with 7 long, 5 (less often 6) short setae. Tergite I with lengths of setae intermediate between those in Figs. 6 and 10. Tergal setae: II, 4 (less often 5); IV, 8–10; V–VII, 10; VIII, 8; larger number of setae due to 1–2 shorter setae at end of each row (Fig. 16). Sternal setae: III–V, 14–16; VI, 10–13; VII, 6–8; larger number of setae as for tergites (Fig. 16). Dimensions (generally wider head and longer, slender body): POW, 0.30–0.31; TW, 0.39–0.40; PW, 0.34–0.36; MW, 0.39–0.42; AW, 0.46–0.51; TL, 1.27–1.38. Genitalia close to Fig. 3, but sac sclerite smaller and variably “U”- to “V”-shaped.

Female.—Essentially as for *C. albuja*, except for differences noted for male above and as follows. Sternal setae: III–IV, 14–17; V, 12–15. Dimensions: POW, 0.31–0.33; TW, 0.40–0.44; HL, 0.24–0.26; PW, 0.35–0.42; MW, 0.41–0.46; AW, 0.54–0.57; TL, 1.39–1.59.

Remarks.—This species can be separated from all others by the unique dorsal head chaetotaxy, the small number of short prosternal setae, and the large number of tergal and sternal setae due to additional shorter lateral setae in each row.

Cummingsia inopinata, the louse parasitizing *Thomasomys*, is a “marsupial” louse phylogenetically. The original description by Méndez (1971) of the new *Cummingsia* from a rodent host, *T. cinereiventer*, left some suspicion as to the possibility of contamination having occurred, and that the true host of *C. inopinata* might actually be a marsupial. Subsequently, we have obtained additional specimens of *Cummingsia* from two specimens of *Thomasomys erro* Anthony in Ecuador and two of *T. laniger* (Thomas) in Colombia. Thus, there is little doubt about the fact that rodents of the genus *Thomasomys* are parasitized by *Cummingsia*. As most Mallophaga found on small mammals are extremely host specific, we made a detailed examination of our specimens from *Thomasomys*, and were able to detect no significant variation in external morphology or in genitalia among the populations of *Cummingsia* found on the three distinct species of *Thomasomys* over a considerable geographic area. Our conclusion is that, at this time, there is no justification for recognizing more than the single species, *C. inopinata*, parasitizing *Thomasomys*.

How and when could a “marsupial” louse have transferred to a rodent host? Méndez (1971) had a series of five males and 18 females from a single *T. cinereiventer* at the type-locality, and a single female from a second *T. cinereiventer*

from another locality in Colombia. He suggested that "*T. cinereiventer* may have acquired the original stock from which the new species of *Cummingsia* . . . was derived, many years ago from opossum nests" (Méndez 1971:27). *Thomasomys* is part of the "complex penis" group of South American cricetines (subfamily: Sigmodontinae) that originated from North American stock, migrating to South America prior to the connection of the two continents by the Panamanian land bridge in the early Pleistocene. The ancestral cricetine may have arrived in South America by the early Pliocene. *Thomasomys* has undergone a tremendous radiation in South America, with some 25 extant species now recognized. With three different species of *Thomasomys*, each being parasitized by the same species of *Cummingsia*, we suggest that an ancestral population of *Thomasomys* acquired *Cummingsia* from a marsupial host prior to the later major radiation in *Thomasomys*. This may have occurred in the Pliocene. *Cummingsia* has undergone little differentiation, even though considerable time has elapsed and speciation within *Thomasomys* has occurred. It will be most interesting to see if additional species of *Thomasomys* are found to harbor *Cummingsia*, and, if so, whether any differentiation has occurred.

Material examined.—1 ♂, 1 ♀ paratypes of *C. inopinata*, ex *Thomasomys cinereiventer*, Colombia, Depto. de Nariño, Laguna de la Cocha, elevation 2700 m. 3 ♂♂, 3 ♀♀, ex *Thomasomys laniger*, Colombia, Antioquia, Paramo. 2 ♂♂, 3 ♀♀, ex *Thomasomys erro*, Ecuador, Napo Province, Papallacta.

Cummingsia intermedia Werneck

Figs. 17–20

Cummingsia intermedia Werneck, 1937:70.

Type-host.—*Marmosa incana paulensis* Tate [Marsupialia: Didelphidae].

Male.—Differing from *C. albuja* as follows. Dorsal head chaetotaxy with only minute setae or alveoli medially; mediolateral setae close to *C. maculata* (Fig. 17). Slender pointed inner head spinous process well separated from outer (Fig. 17). With reduced carina across posterior head margin and with medioposterior protrusion (Fig. 17). Prosternal plate with 11 short stout setae; mesosternal plate with 9 such setae; metasternal plate with total of 22 setae. Tergal setae: II, 7; III–IV, 8; V–VI, 9; VII, 8. Sternal setae: I, 18; II, 34; III, 26; IV, 25; V, 21; VI, 20; VII, 11; included in these 12, 9, 7, 6, and 1 short anterior setae on III–VII, respectively. Dimensions: POW, 0.29; HL, 0.26; MW, 0.43; AW, 0.61; TL, 1.35. Genital plate shaped as in Fig. 19, much like that of foregoing species; genital sac sclerite semicircular (Fig. 18); tip of paramere (Fig. 20) with seta near end in close proximity to dark button-like projection; GW, 0.11.

Female.—Much as for male, except as follows. Prosternal plate with 10 short stout setae; metasternal plate with 21 setae. Tergal setae: II, 6; IV, 9; V, 8; VII, 9; VIII, 5. Sternal setae: I, 15; II, 36; III, 23; IV, 22; V, 20; VI, 16; VII, 10; included in these 8, 8, 6, 4, and 2 short anterior setae on III–VII, respectively. Anus with 30 setae; ventral terminalia essentially as in Fig. 8. Dimensions: POW, 0.31; TW, 0.39; HL, 0.26; PW, 0.36; MW, 0.44; AW, 0.69; TL, 1.50.

Remarks.—This species differs from all of the preceding species by its medial dorsal head chaetotaxy, the shape and proximity of the ventral spinous head processes, the large number of short stout spiniform setae on the prosternal and

mesosternal plates, the shape of the male genital sac sclerite and the details of the tip of the paramere, and the large number of abdominal setae.

In the absence of specimens from the type-host, *M. incana*, we tentatively assign our material from *M. dryas* Thomas to *C. intermedia* in accordance with Emerson and Price (1975). There are slight discrepancies between the illustrations provided by Werneck (1937) and the material from *M. dryas* that we have before us. As Werneck's illustrations and descriptions are of insufficient quality to evaluate these discrepancies, we chose not to treat them at this time, hoping additional material will be available in the future.

Illustrations of the adult male and female and details of the genitalia of *C. intermedia* from *M. dryas* may be found in Emerson and Price (1975:figs. 19–22).

Material examined.—1 ♂, 1 ♀, ex *Marmosa dryas*, Venezuela, Merida, Tabay.

Subgenus *Acanthomenopon* Harrison

Acanthomenopon Harrison, 1922:156.

Type-species.—*A. horridum* Harrison.

Remarks.—In his description of the genus *Cummingsia*, Ferris (1922:83) stated "It is with some hesitation that I refer the two species above named to the same genus, for in the structure of the head there is a rather notable difference. I would especially call attention to the apparent absence of the maxillary lobes in *C. peramydis*. However, they are not so different that their association in the same genus is entirely incongruous and in some respects they are very similar."

We concur with the belief of Ferris that *C. peramydis* presents an array of differences from the other species of *Cummingsia*, but, rather than place it in a genus of its own, we prefer to place it in a subgenus of *Cummingsia*. The following features characterize the subgenus *Acanthomenopon*: head shaped much as in Fig. 21; temple with each side having 3 very long, 1 long, and 1 minute setae placed at margin (Fig. 21); postmentum with 1 long seta (Fig. 21); gula with chaetotaxy of 2 very long + 3 much shorter setae on each side and with spinous sculpturing on posterior portion (Fig. 21); metanotal chaetotaxy as in Fig. 22, with 3 very long marginal setae on each side and shorter setae placed as shown; marginal tergal and sternal setae with short among long (Fig. 23); and female subgenital plate as in Fig. 23, with 4 prominent medioposterior setae.

Cummingsia peramydis Ferris

Figs. 21–24

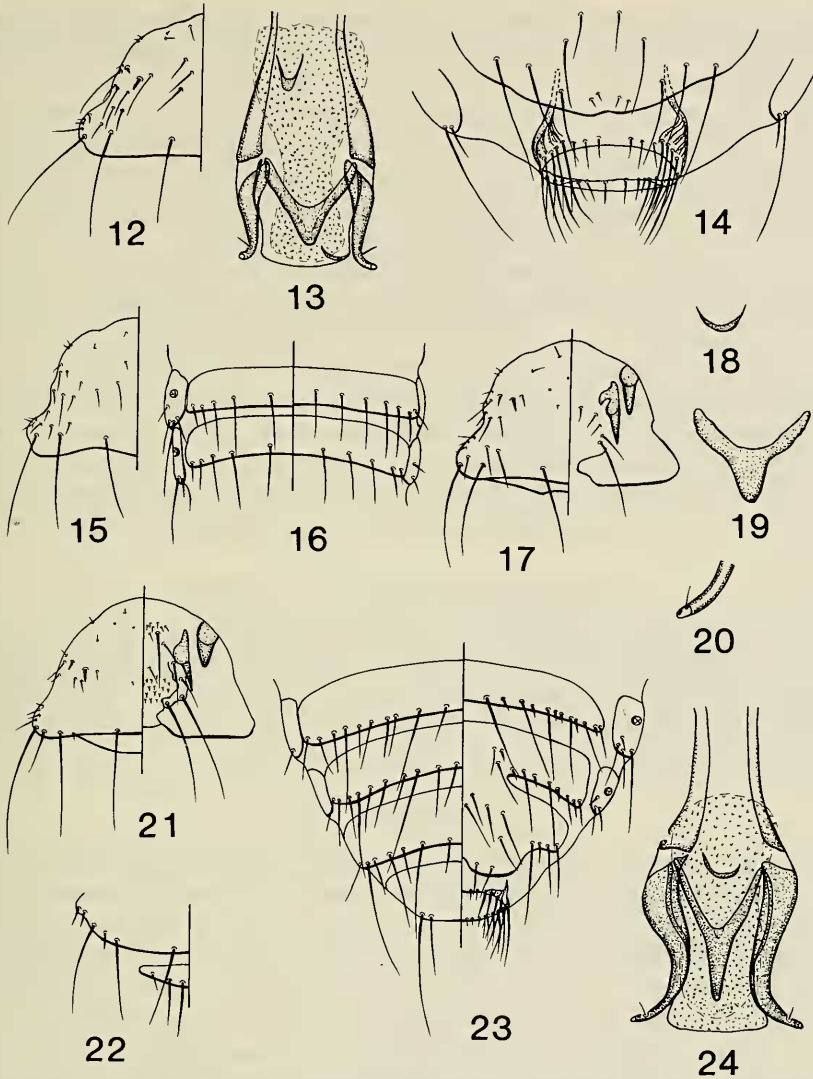
Cummingsia peramydis Ferris, 1922:85.

Type-host.—*Peramys domesticus* = *Monodelphis domestica* (Wagner) [Marsupialia: Didelphidae].

Acanthomenopon horridum Harrison, 1922:156.

Type-host.—*Peramys domesticus* = *Monodelphis domestica* (Wagner).

Male.—Grossly as in Fig. 1. Dorsal head chaetotaxy as in Fig. 21, with at most only minute seta medioanteriorly. Ventral spinous head processes (Fig. 21) much as for *C. intermedia*. With reduced carina across posterior head margin and with



Figs. 12–24. 12–14. *Cummingsia perezii*: 12, Dorsal male head; 13, Apical portion of male genitalia; 14, Ventral female terminalia. 15–16. *C. inopinata*: 15, Dorsal male head; 16, Dorsal-ventral male abdominal segments V–VI. 17–20. *C. intermedia*: 17, Dorsal-ventral male head; 18, Male genital sac sclerite; 19, Male genital plate; 20, Tip of male genitalic paramere. 21–24. *C. peramydis*: 21, Dorsal-ventral male head; 22, Dorsal male metathorax margin and abdominal tergite I; 23, Dorsal-ventral female terminalia; 24, Apical portion of male genitalia.

medioposterior protrusion (Fig. 21). Prosternal plate with 5–6 long, 11–13 short stout setae; mesosternal plate with 4 long, 12–15 short stout setae; metasternal plate with 18–21 setae. Tergal setae: I, 5–6; II, 10–12; III, 13–16; IV, 15–18; V, 16–19; VI, 15–19; VII, 14–18; VIII, 12–17; IX, 8. Sternal setae: I, 11–12; II, 24–29; III, 21–22; IV–V, 22–25; VI, 21–22; VII, 15–19. Subgenital plate with 13–14 setae. Dimensions: POW, 0.29–0.32; TW, 0.35–0.40; HL, 0.23–0.26; PW, 0.31–0.38; MW, 0.34–0.43; AW, 0.51–0.56; TL, 1.18–1.39. Genitalia as in Fig. 24,

with semicircular sac sclerite much as for *C. intermedia*, greatly elongated genital plate, and pronouncedly outwardly curved paramere tips; GW, 0.09–0.10; GPW, 0.06–0.07; GPL, 0.10.

Female.—Much as for male, differing as follows. Prosternal plate with 12–15 short stout setae. Tergal setae: I, 6–7; II, 12–13; IV–VII, 17–20; IX, 4. Sternal setae: II, 27–32; III, 22–23; IV–VI, 22–26; VII, 17–21. Subgenital plate with 20–22 setae (Fig. 23). Anus with 30–33 setae. Dimensions: POW, 0.31–0.33; TW, 0.38–0.43; PW, 0.35–0.40; AW, 0.64–0.66 TL, 1.46–1.60.

Remarks.—As the sole member of the subgenus *Acanthomenopon*, *C. peramydis* is easily separated from the other five species of *Cummingsia* on the basis of the subgeneric characters.

Ferris (1922:85) listed the type-host and type-locality of *C. peramydis* as “*Peromys domesticus*, Quixada, Brazil, from skins in the Field Columbian Museum.” The mammal collections of the Field Museum of Natural History contain a series of nine *Monodelphis domestica* from: Brazil, Ceará Province, Quixada, collected between 18 and 29 June 1913 by R. H. Becker (FMNH 20245–20251, 20254–20255). We were able to obtain five additional specimens of *C. peramydis* from these skins.

Illustrations of the adult male and female of *C. peramydis* and details of the genitalia were provided by Emerson and Price (1975:figs. 15–18).

Material examined.—5 ♂♂, ex *Monodelphis domestica*, Brazil, Ceará, Quixada. 3 ♂♂, 2 ♀♀, ex *M. brevicaudata* (Erxleben), Venezuela, Trujillo, Valera (Isnotu), and Falcón, 5 km N, 13 km E of Mirimire near La Pastora. 1 ♂, 2 ♀♀, ex *M. brevicaudata touan* (Shaw) Brazil, Amapá, Serro do Navio.

Discussion

The genus *Caenolestes* as now defined contains five parapatric species: *C. caniventer* Anthony known from southwestern Ecuador, *C. convelatus* Anthony known from north-central Ecuador, *C. fuliginosus* known from north-central Ecuador and extreme northern Peru, *C. obscurus* Thomas, known from northern and western Colombia and extreme western Venezuela, and *C. tatei* Anthony known from south-central Ecuador. All five species are distributed throughout the Andean mountains from northern and western Colombia and extreme western Venezuela south through Ecuador. The populations of *Caenolestes* now recognized as species probably represent only two or three valid species (Kirsch 1977). Three of the currently named taxa are known only from or very near the type-localities. *Lestoros* and *Rhyncholestes* are both monotypic. Simpson (1970) also suggested that the three genera of the family Caenolestidae, *Caenolestes*, *Lestoros*, and *Rhyncholestes*, would perhaps best be regarded as three species of a single genus. Marshall (1980), in a review of both the fossil and Recent forms of the family, considered the genera *Caenolestes* and *Lestoros* as marginally separable. This close relationship between *Caenolestes* and *Lestoros* is strongly supported by Hayman et al. (1971) who reported that the karyotypes of *Caenolestes obscurus* and *Lestoros inca* are nearly identical. The genus *Marmosa* contains some 44 species distributed throughout much of Central and South America. Mallophaga have been collected on only two of those species, *M. dryas* which is found in

western Venezuela and *M. incana* which is found in eastern Brazil. The genus *Monodelphis* contains some 17 species distributed throughout much of South America. Again, Mallophaga have been collected on only two species, *M. brevicaudata* which is found in Venezuela, the Guianas, Brazil, Paraguay, and northern Argentina, and *M. domestica* which is found in eastern and central Brazil, Bolivia, and Paraguay. In a cladistic analysis of the carnivorous marsupials, Kirsch and Archer (1982:616) suggested that *Marmosa* and *Monodelphis* (along with *Lesiodelphys*) formed a monophyletic unit and that the specialized caenolestids were derived from “forms like *Monodelphis brevicaudata*.”

Herein, we recognize six species of *Cummingsia* from seven species of South American caenolestid and didelphoid marsupials and from three species of the rodent genus *Thomasomys*. Except for the caenolestids, all of the mammalian genera involved as hosts for *Cummingsia* are widespread in South America and all are in need of revision. However, combined they provisionally contain over 80 species and we have lice from only nine of these. Thus, we suspect that numerous new species of *Cummingsia* have yet to be collected, and much remains to be learned about the systematics and host relationships in this genus.

Key to the Species of *Cummingsia*

- 1. Marginal setae of abdominal tergites and sternites III–VII with obviously shorter among longer setae (Fig. 23); gula with 2 very long setae on each side (Fig. 21) Subgenus *Acanthomenopon* *peramydis* Ferris
- Marginal setae of abdominal tergites and sternites III–VII essentially of subequal lengths, except for occasional 1–2 setae at end of row (Fig. 1 or 16); gula with only 1 very long seta on each side (Fig. 1 or 17) Subgenus *Cummingsia* 2
- 2. Abdominal tergites II–VII each with only 6 setae (Fig. 1) *albuyai* n. sp.
- At least several of abdominal tergites II–VII with more than 6 setae 3
- 3. Median dorsal head with only minute setae or alveoli (Fig. 17); prosternal plate with at least 10 short stout setae; male genitalia with paramere tip as in Fig. 20 and sac sclerite as in Fig. 18 *intermedia* Werneck
- Median dorsal head with short to medium setae (Figs. 9, 12, or 15); prosternal plate with only up to 7 short stout setae; male genitalia with paramere tip near to Fig. 4 and sac sclerite nearer to Fig. 11 or 13 4
- 4. Laterodorsal head without stout spiniform setae (Fig. 15); prosternal plate with only 4–6 short stout setae *inopinata* Méndez
- Laterodorsal head with stout spiniform setae (Fig. 9 or 12); prosternal plate with 7 short stout setae 5
- 5. Head with long seta immediately mediad to inner dorsal spiniform seta (Fig. 12); posterior portion of female subgenital plate as in Fig. 14, with pair of very long lateroposterior setae on each side and lacking medio-posterior division; male genital sac sclerite as in Fig. 13 *perezi* n. sp.
- Head with short seta immediately mediad to inner dorsal spiniform seta (Fig. 9); posterior portion of female subgenital plate as in Fig. 8, with only single very long lateroposterior seta on each side and with medioposterior division; male genital sac sclerite as in Fig. 11 *maculata* Ferris

Acknowledgments

We are grateful to Barbara L. Clauson, to Angelitos and Richard Garrett for assistance in the field, and to Luis Albuja, Ramiro Barriga, and Gustavo Orcés of the Escuela Politécnica Nacional, Quito, and Donald J. Stewart and Myriam Ibarra for logistic support while in Ecuador. Sr. Carlos Perez Q., owner of Hacienda La Vega, graciously allowed us to work on his property where the two new species of *Cummingsia* were obtained. We thank Barry M. O'Connor, University of Michigan, K. C. Emerson, Sanibel, Florida, William A. Drew, Oklahoma State University, and Bernard C. Nelson and John A. Chemsak, University of California, Berkeley, for making critical specimens of *Cummingsia* available to us. This project was supported in part by a grant from the National Science Foundation, INT-8303194. Support from the Escuela Politécnica Nacional and Field Museum of Natural History is gratefully acknowledged. This paper is published as Paper No. 14,078 of the Scientific Journal Series of the Minnesota Agricultural Experimental Station on research conducted under Minnesota Agricultural Experiment Station Projects No. Min-17-015 and Min-17-016.

Literature Cited

- Barkley, L. J., and J. O. Whitaker, Jr. 1984. Confirmation of *Caenolestes* in Peru with information on diet.—*Journal of Mammalogy* 65:328–330.
- Emerson, K. C., and R. D. Price. 1975. Mallophaga of Venezuelan mammals.—*Brigham Young University Science Bulletin, Biological Series* 20:1–77.
- , and ———. 1981. A host-parasite list of the Mallophaga on mammals.—*Miscellaneous Publications of the Entomological Society of America* 12:1–72.
- Ferris, G. F. 1922. The mallophagan family Trimenoponidae.—*Parasitology* 14:75–86.
- Harrison, L. 1922. On the mallophagan family Trimenoponidae; with a description of a new genus and species from an American marsupial.—*The Australian Zoologist* 2:154–158.
- Hayman, D. L., J. A. W. Kirsch, P. G. Martin, and P. F. Waller. 1971. Chromosomal and serological studies on the Caenolestidae and their implications for marsupial evolution.—*Nature* 231:194–195.
- Kirsch, J. A. W. 1977. The comparative serology of Marsupialia, and a classification of marsupials.—*Australian Zoology, Supplement, series* 52:1–152.
- , and M. Archer. 1982. Polythetic cladistics, or, when parsimony's not enough: The relationships of carnivorous marsupials.—*In* M. Archer, ed., *Carnivorous marsupials. Volume 2.*—Royal Zoological Society of New South Wales, pp. 595–619.
- Marshall, L. G. 1980. Systematics of the South American marsupial family Caenolestidae.—*Fieldiana: Geology, New Series* 5:vii + 1–145.
- Méndez, E. 1971. A new species of the genus *Cummingsia* Ferris from the Republic of Colombia (Mallophaga: Trimenoponidae).—*Proceedings of the Entomological Society of Washington* 73: 23–27.
- Simpson, G. G. 1970. The Argyrolagidae, extinct South American marsupials.—*Bulletin of the Museum of Comparative Zoology* 139:1–86.
- Werneck, F. L. 1937. Nova especie do genero *Cummingsia* (Mallophaga: Trimenoponidae).—*Memorias do Instituto Oswaldo Cruz* 32:69–73.

(RMT) Division of Mammals, Field Museum of Natural History, Chicago, Illinois 60605; (RDP) Department of Entomology, University of Minnesota, St. Paul, Minnesota 55108.